THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARK A. BUONANNO

Appeal No. 1997-0316
Application 08/218,951[1]

ON BRIEF

Before THOMAS, KRASS, and DIXON, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1 through 12, 15 through 21 and 23 through 25, all of the claims pending.

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[1]Application for patent filed March 23, 1994.

The invention is directed to a thermal inkjet printhead. More particularly, an electrically activated heating element is disposed in thermal communication with ink in the ink firing chamber and a continuous thermally insulating layer having at least one heterogeneous nucleation site in the form of a discontinuity in the thermally insulating layer is placed between the heating element and the ink firing chamber. The discontinuity allows consistent location of the ink bubble at a selected location on the thermally insulating layer since it reduces the free energy of formation for the ink bubble.

Representative independent claim 1[2] is reproduced as follows:

1. A thermal inkjet printhead arranged such that a consistently located gas phase ink bubble is formed comprising:

an ink firing chamber for containing ink;

an electrically activated essentially planar heating element disposed in thermal communication with said ink firing chamber;

a thermally insulating layer disposed continuously between said heating element and said ink firing chamber, said

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[2]The amendment after final filed July 19, 1996, Paper No. 11, has been treated as entered in accordance with the examiner's instructions even though, at the time of this decision, it had not been physically entered.

thermally insulating layer further comprising at least one preferred heterogeneous nucleation site as a discontinuity in said thermally insulating layer which reduces the critical free energy of formation for the gas phase ink bubble and selectively disposed on a surface of said thermally insulating layer which is in contact with ink when ink is in said ink firing chamber, whereby a consistently located gas phase ink bubble may be formed; and

an orifice plate forming at least one boundary of said ink firing chamber and including at least one orifice from which ink from said ink firing chamber is expelled normal to the plane of said heating element when said heating element is electrically activated.

The examiner relies on the following references:

Scheu	4,513,298	Apr. 23, 1985
Shiozaki	63-34144[3]	Feb. 13, 1988
Taniguchi et al. (Taniguchi)	2-103150[3]	Apr. 16, 1990

Claims 1 through 12, 15 through 21 and 23 through 25 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner cites Shiozaki in view of Taniguchi with regard to claims 1 through 7, 12, 15 through 17, 21, 23 and 24 and Shiozaki in view of Scheu with regard to claims 8 through 11, 18 through 20 and 25.

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[3]Our understanding of the Shiozaki and Taniguchi references is based on English translations thereof provided by appellant.

Reference is made to the brief and answer for the respective positions of appellant and the examiner.

OPINION

We reverse.

Each rejection under 35 U.S.C. § 103 is based on a combination of Shiozaki and another reference. Both appellant and the examiner agree that while the instant claimed invention is directed to a "top shooter" printhead, i.e., where ink is ejected in a direction perpendicular to the plane of the heater resistor, as is Taniguchi and Scheu, the primary reference to
Shiozaki is directed to a "side shooter" printhead, i.e., where ink is ejected in a direction parallel to the plane of the heater resistor.

Accordingly, the examiner is combining different types of printhead technologies (the "side shooter" of Shiozaki with the "top shooters" of Taniguchi and Scheu) in order to arrive at the instant claimed invention. While the instant claims do not recite a "top shooter" printhead specifically, it is clear that this is the type of technology to which the instant claims are directed. Independent claims 1 and 12 recite "ink

from said ink firing chamber is expelled normal to the plane of said heating element." Independent claims 8, 18 and 25 each recite a heterogeneous nucleation site selectively disposed "within an essentially perpendicularly projected footprint of one orifice on a surface of said barrier layer..." or "within a footprint of one of said at least one orifice essentially perpendicularly projected on said thermally insulating layer..."

Appellant explains in great detail, at pages 7-9 of the brief, why the "top shooter" and "side shooter" printheads are not interchangeable technologies because of different kinds of problems and concerns and how Shiozaki's "side shooter" printhead does not need to control the location of vapor bubble *formation*. Yet, in the face of this reasonable explanation as to why the skilled artisan would not seek to combine the two types of technologies, the examiner merely takes the position that "[s]ince both forms of thermal ink jet generate a vapor bubble to eject a drop of ink, they are functionally alternative and interchangeable. In addition, they are art recognized as both alternative and interchangeable" [answer-page 5].

In our view, appellant has established a reasonable basis to believe that the two types of printheads are not interchangeable and the examiner has offered no proof of his allegation of them being "art recognized as both alternative and interchangeable." In addition to a lack of any motivation for making the suggested combinations of references, even if combined, it is not at all clear how the examiner would modify the "side shooter" printhead of Shiozaki, via the teachings of the other references, in order to not only provide for the instant claimed elements but also to provide for the "top shooter" type of printhead required by the language of the instant claims.

While we agree with the examiner that the discontinuity of Shiozaki may be considered to be "selectively disposed," as broadly claimed, as explained supra, we cannot agree with the examiner's combination of references. We also point out, as did appellant, that Taniguchi, albeit directed to a "top shooter" type of printhead, actually teaches away from the claimed invention because Taniguchi indicates [page 3 of the translation] that discontinuities are problems to be avoided

while the instant claimed invention purposely relies on discontinuities.

The examiner's decision rejecting claims 1 through 12, 15 through 21 and 23 through 25 under 35 U.S.C. § 103 is reversed.

REVERSED

James D. Thomas Administrative Patent Judge	)	
Errol A. Krass Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
Joseph L. Dixon Administrative Patent Judge	)	

tdl

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